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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,670	06/25/2003	Shunko Magoshi	03180.0324	1972

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Finnegan, Henderson, Farabow,
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EXAMINER

HASHMI, ZIA R

ART UNIT PAPER NUMBER

2881

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/602,670	Applicant(s) MAGOSHI ET AL.	
	Examiner Zia R. Hashmi	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/2/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-22 are rejected under U.S.C. 103(a) as being unpatentable over Murai et al. (Pub. No : US 2003/0093767 A1), over Ashton et al. (5,051,598).

3. With respect to independent claims 1, 8, 15, and 22, Murai et al. disclose a method and apparatus for correcting a proximity effect (para 0012, lines 1-7, and para 0017, lines 3-5, para 0038, lines 1-9) applied to a dose of an electron beam exposure (col. 6, lines 20-42 and 116 in Fig. 1), comprising: classifying an underlying pattern of a level underlying a thin film layer (para 0034, lines 41-45); dividing a processing pattern to be transferred on the thin film layer into a first pattern overlapping with the underlying pattern and a second pattern which does not overlap with the underlying pattern according to the classified underlying pattern (Abstract, lines 1-8, para 0016, lines 24-30, Fig. 2, 3A-C, 4, 5D, 7E, and 10); and calculating a pattern area density for the first and second patterns in a unit region (Abstract, lines 1-8, para 0016, lines 15-18, Fig. 6A, 107, 112, & 114 in Fig. 1). The above exposure method also comprises a substrate surface with a resist film on which a pattern is to be fabricated by an electron beam configured to delineate on the resist film (para 004, lines 1-9).

4. With respect to dependent claims 2-3, 9-10, and 16-17, Murai et al. disclose that their pattern processing is by means of electron beam exposure, wherein the pattern is divided by use of logic operation process (para 0038, lines 1-9), in order to execute processing by a computer, for correction of the proximity effect, etc.

5. With respect to claims 1, 4-8, 11-15, and 18-22, Murai et al., fail to disclose method of calculating a corrected dose for proximity effect for processing pattern according to pattern area density, or related equations expressing various factors involved. Ashton et al., however, disclose method of calculating a corrected dose for the processing pattern according to the pattern area density (Abstract, lines 1-2 & 11-20 and mathematical formulation as presented in column 7, lines 46 through column 12, line 52, and equations 1-9 and steps shown in Fig. 3B & 4B). This disclosure also includes corrected dose of a proximity effect of the electron beam exposure expressed by a dose correction equation having a linear connection of the pattern area densities (col. 10, lines 47-68 and col. 11, equation 5).


It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to combine the methods and apparatus of Murai and Ashton et al., and add features like loading the substrate on a movable stage of the exposure apparatus, or add a proximity correction module, which is equivalent to a computer normally used, because Ashton et al. teach (col. 7, lines 46-47) that a limitation to the effectiveness of the electron beam lithographic technique is caused by electron scattering.

Conclusion

6. Jones et al. disclose (6,499,003) a method and apparatus for application of proximity correction with unitary segmentation.
7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact Electronic Business Center (EBC) at 866-217-9197 (toll-free).
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zia Hashmi whose telephone number is (571) 272-2473. The examiner can normally be reached between 8.30 AM- 5 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477.

Zia Hashmi

April 30, 2004.


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800